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ABSTRACT

This speech considers how to (1) encourage educators to become more sophisticated regarding the strengths and limitations of measurable objectives; (2) decide on appropriate levels of specificity; (3) identify the most appropriate objective for operationalizing a general goal; (4) avoid the aversive task of generating measurable objectives by expending more talent and energy in creating pools of objectives and measures; (5) decide on desired levels of proficiency; (6) reduce excessive preoccupation with prespecified objectives; (7) allay educators' unwarranted anxieties stemming from the use of measurable objectives; and (8) stimulate the development of more objectives and measures in the affective domain. The author suggests that while these problems represent fascinating intellectual challenges, considerably more is known today about the problems than was known ten years ago. (Author/DN)

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CURRICULUM DESIGN -- THE PROBLEM OF SPECIFYING INTENDED LEARNING OUTCOMES*

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Any enlightened curriculum designer who embarks in the early seventies on a serious effort to specify the intended learning outcomes of an instructional enterprise will find that task far more manageable today than was the case a decade ago. For we now have over a dozen years of rather intense experience in attempting to satisfactorily specify the outcomes that we hope our educational endeavors will promote. During this period, probably commencing about 1960, we have not only sharpened our technology of specifying intended outcomes but have also discovered a number of key deficits in that technology. Indeed, a clearly identifiable set of problems has arisen with respect to how curriculum designers can most profitably frame their intentions. A consideration of these problems will constitute the focus of this analysis.

In reviewing the difficulties encountered since 1960 by anyone who has seriously attempted to specify instructional outcomes, we can identify some problems that by this time have been solved completely, some which have been partially solved, and a group of more vexing problems which have hardly been dented. To illustrate one of the difficulties which has been pretty well resolved, we can consider the dearth in the early sixties of resource materials which could be used by the interested educator who wished to become more

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familiar with the ingredients of a well formed instructional objective. One of the chief reasons for the success of Robert Mager's short, readable account[1] of how to state objectives in measurable form was that when it was published in 1962 it was almost unique. In those days an educator who wanted to gain access to an analysis of the ingredients of a measurable objective either had to read Mager or engage in extended introspection. Now, however, this shortage has been more than rectified with myriad textbooks, pamphlets, filmstrips, and audiotapes available on the topic of how instructional objectives should be formulated. The shortage of instructional materials dealing with educational objectives has been so well solved, in fact, that we almost experience a new problem now of choosing from a surfeited market. But problems that have been solved are not as interesting as problems that remain unresolved. Accordingly, the remainder of this analysis will attend to those perplexities which, at least in large measure, have resisted our solution efforts.

Generating Interest in the Enterprise

For centuries scholars have offered admonitions regarding the perils of imprecise thinking about one's goals. And when we consider the task of specifying intended learning outcomes, most often the vehicle for accomplishing this is by stating one's instructional goals (typically at a higher level of generality) or one's objectives (at a more specific level). Educators have also been advised intermittently through the ages to frame their instructional aims in more explicit fashion. But, aside from these occasional flashes of right-thinking, few educators were ever sufficiently moved to offer anything more than rhetorical support for explicitly stated

[1]Mager, Robert F. Preparing Instructional Objectives, Fearon Publishers, San Francisco, 1962.

instructional objectives. By and large, most educational objectives, if they were used at all, were articulated at a level of generality more reminiscent of motherhood and the good life than of a clear-headed attempt to describe one's instructional intentions.

But in the early sixties this situation began, slowly, to change. People started to cite the instructional merits of behavioral objec-jectives. For a variety of reasons[2], educators were being urged to articulate their instructional intentions more lucidly, preferably in terms of the post-instruction behavior of learners. These early proponents of behavioral objectives were generally trying to get educators to eschew their characteristic focus on the teacher's activities or the course content to be covered, and instead to concern themselves with the kinds of changes in learners they were trying to produce. It was for this reason that they employed the adjective behavioral to signify the target of their concerns, i.e., the post-instruction behavior of learners. Had these early advocates of precise objectives realized how many opponents of such objectives would have tied behavioral objectives to a behaviorist philosophical or psychological position, then a less provocative (and potentially misleading) adjective would have surely been adopted.

The most important quality of an objective which satisfactorily describes one's instructional intentions is that it be measurable. Indeed, measurability is the sine qua non of a properly stated instructional objective, irrespective of whether the objective is depicted as a behavioral, operational, performance, or measurable objective. Unfortunate associations with a particular approach regarding how such measurable changes should be promoted, e.g.,

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[2]For a consideration of the probable causative factors involved in the increased interest in such objectives, see Popham, W.J., "Objectives: 1960-1970," NSPI Bulletin, Vol. 9, No. 6, July, 1970, pp. 5-7.

via behavioristic strategies, only introduce confusion.

In brief, the early proponents of measurable instructional objectives offered three main reasons why educators should adopt objectives stated in that fashion. First, there was a curricular advantage, i.e., since a measurable objective was less ambiguous, its worth could be more rigorously appraised by appropriate judges. Second, there were instructional dividends, such as the possibility of designing more relevant instructional sequences when the instructional planner possessed a better idea of the desired criterion behavior. And third, there were clear evaluation dividends, in that one could appraise the worth of an instructional sequence (if not exclusively, then at least in large measure) on the basis of whether the learners displayed post-instruction mastery of the objectives.

By stressing these three advantages, advocates of measurable objectives were able to corral a fair amount of support for the use of precise goals. This support was particularly significant when its locus was in government educational bureaucracies, for when requests for governmental education funds had to be accompanied by project plans which included measurable objectives, such preferences were assiduously heeded in the field.

Because of an increased use of measurable objectives in the schools, a clearly discernable phenonomen by the mid- and late-sixties, we began to discover both strengths and limitations of such objectives. We encountered some of the philosophical and technical problems which still vex us, but which in some cases we are slowly beginning to solve.

Even though many more educators are superficially aware of the potential merits of measurable objectives as a new instructional

tool, there are still too many curriculum designers who have only a nodding acquaintance with the intricacies of such objectives. Too many have only read Mager's little volume and have thus taken that 45 minute trip from ignorance to expertise. Too many have encountered a few trivial, albeit measurable objectives and assumed that only worthless kinds of goals can be translated to measurable objectives. We need more educators who possess greater sophistication regarding the appropriate and inappropriate applications of measurable instructional objectives. Once we have established high consensus educational goals for our society, we still face the super-sticky problem of how to translate these goals into measurable formulations which adequately reflect the broader goals on which they are based. To accomplish this tremendous translation task we will need a larger talent pool of sophisticated curriculum designers than currently exists. And securing such a talent pool is no small problem.

An Appropriate Level of Specificity

One of the most sticky problems faced by those who would foster the more judicious use of measurable instructional objectives is associated with how specificially our objectives should be formulated. For we learned a nasty lesson in the early sixties, namely, that increasing the specificity of an instructional objective does not necessarily increase its utility. Certainly we were able to write objectives so precise that they were essentially equivalent to a single test item, and such objectives were surely unambigious. But by doing so we ended up with so many objectives that they were running out our ears. A more parsimoneous strategy was clearly needed.

In our quest for serviceable objectives we must achieve that delicate balance between the twin criteria of clarity and practicality. The trick, it would appear, is to devise a scheme for isolating the important dimensions of a class of learner behaviors we are attempting to promote, then to describe those dimensions with a degree of detail such that the description is sufficiently circumscribing for clear communication, yet not so lengthy that educators will avoid employing it. That is a nontrivial trick.

We have some experience now in testing the limits of several approaches to this troubling question. For example, Hively[3] and his associates have attempted to provide rules for defining domains of learner behaviors which will allow test constructors to generate adequate measures of such domains. Unfortunately, the level of detail yielded by Hively's domain-referenced achievement testing approach is generally so great that few educators express a willingness to use the system on a sustained basis. At the other extreme, if we try to employ a terse objective written in telegraphese, we end up either with test-item equivalent objectives or with objectives too general to communicate satisfactorily.

Recently, some efforts have been made to aim for a more moderate descriptive stance through the use of amplified objectives[4] which represent descriptions that fall somewhere between a Mager short-form objective and a Hively encyclopedic domain description. However, the rules for the replicable production of desired degrees of specificity are extremely primitive at this point. Such rules must be empirically tested, not only with respect to the degree to

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[3]Maxwell, G. et al., Curriculum Evaluation in the MINNEMAST Project: A Case Study in Domain-Referenced Testing, University of Minnesota, Minneapolis, 1971.

[4]See the descriptive literature associated with IOX Objectives-Based Tests, Instructional Objectives Exchange, Box 24095, Los Angeles, California 90024.

which they communicate unambiguously to various sorts of educators, but also with respect to the degree to which satisfactorily homogeneous measures can be produced from such specifications.

We should also recognize that optimal degrees of specificity may vary depending on the context within which the objective is used. To illustrate, for purposes of developing instructional materials we may require far better delineated objectives than required to carry out needs assessment operations (in which attempts are made to secure parental preferences regarding what aims the schools should be pursuing).

Clearly, the solution to this complicated problem of optimal specificity level would have significant benefits for the users of instructional objectives.

Defining Goals With Optimal Performance Objectives

As curriculum designers become more skilled at isolating defensible goals for our educational systems, they then encounter the problem of deciding how to operationalize such goals via the description of a class of learner behaviors which will satisfactorily reflect the more general goal. This is a difficult task, for from any general goal, e.g., "Students will display adequate knowledge of the political process," we could derive an almost unlimited set of measurable objectives, most of which would be considered acceptable indicators of the more general goal. But practicality dictates that we cannot employ all of the legitimate indicators of a general construct, thus we shall have to do our best to select as desired objectives those classes (domains) of learner behavior which possess the greatest likelihood of transferring to those other domains which might also serve as indicators of the general goal under consider-

ation. In other words, once a student had mastered behavior $\underline{x}_3$ which is being used as an indicator of Goal $\underline{X}$, then that mastery would be likely to extend to other behaviors such as $\underline{x}_1$, $\underline{x}_2$, $\underline{x}_3$, etc. Ideally, we would also select domains which, once mastered, would permit the learner to more readily master related goals. But the rules for identifying such high transfer behavior domains have not yet been explicated, much less tested.

An alternative strategy, of course, would be to sample from a wide array of learner behaviors in an effort to get a general fix on such elusive constructs as "quantitative competence" or "good citizenship." But then we are back in the standardized test game where results are both difficult to promote and to interpret.

Selecting the best classes of learner behaviors to operationalize educational goals is indeed a high priority problem for educators who wish to employ objectives profitably.

Avoiding the Onerous

Even when curriculum designers are persuaded that the use of measurable instructional objectives would be desirable, there are precious few who possess the perserverance to generate the requisite number of high quality goals needed for a given project. These curriculum designers have discovered what many classroom teachers had already learned, namely, that formulating objectives which are both measurable and worthwhile is one devil of a lot of work.

Rather than requiring the well-meaning curriculum designer to whomp up a pile of measurable goals before playing a rigorous instructional game, it may make more sense to assemble pools of objectives from which the astute developer can select appropriate objectives without the burden of developing them afresh. Several

agencies[5] have now begun to collect sets of measurable objectives which may be used in this manner by curriculum designers. Such objectives collections can, of course, be augmented by a curriculum specialist should the available pool appear deficient for a given instructional purpose. But such augmentations represent a far more realistic amount of work for the busy curriculum designer, in contrast to a thoroughgoing wheel re-invention.

Even though the objectives-selection strategy seems to provide a vehicle for avoiding the often debilitating enterprise of objectives generation, there is still a problem we face stemming from the fact that the current reservoirs of instructional objectives are far from adequate -- both quantitatively and qualitatively. While we may expect a reasonable degree of improvement over time as these collections are revised, in the meanwhile the curriculum designer will be forced to employ a resource that does not often satisfy the requirements of many instructional situations.

Think of how useful such objectives collections could be if they were higher quality, wide ranging, classified in several ways for ease of access, and even possessed some frosting refinements such as ratings of curricular importance by different types of clienteles in different types of educational settings. Suppose, for example, that individuals selecting curricular objectives had access to a well documented array of preferences for various objectives registered by such groups as students, teachers, community

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[5] For example, the Instructional Objectives Exchange, Box 24095, Los Angeles, California 90024, distributes over 45 collections of affective and cognitive objectives. Objectives and related tests of the Wisconsin Design for Reading Skill Development are available from National Computer Systems, 4401 W. 76th St., Minneapolis, Minnesota 55435. The Center for the Study of Evaluation, University of California, Los Angeles, distributes extensive lists of goals and objectives in several subject fields.

representatives, academicians, parents, futurists, etc. While such data would not dictate which objectives should be selected for a given educational setting, the information could obviously be of considerable value to those obliged to select some, but not all objectives.

But until a sufficient number of high quality objectives collections exist, the diligent curriculum designer is in for a good deal of rather aversive work. We need to engage in some priority-shifting so that more energy and talent are expended when objectives are written in the first place, then pool the results of these efforts in order to produce a first-rate resource for curriculum designers.

Determining Defensible Proficiency Levels

For certain educational purposes it is sufficient to devise objectives which merely describe a class of intended learner behaviors, but make no effort to signify how well the learners are expected to display that behavior. For instance, an instructional designer may be able to construct an early version of an instructional product by relying exclusively on a clear description of the post-instruction behavior sought of learners. Desired levels of proficiency, at this point, are almost irrelevant.

But for other situations it is highly desirable to attach to statements of instructional objectives a supplementary piece of information dealing with the degree of proficiency with which the learner is expected to display a sought-for behavior. To illustrate, suppose the instructional designers referred to above was now ready to field test his prototype instructional product and wanted to decide whether it was working well enough or whether a revision was

warranted. How good is good? Clearly, a decision has to be made regarding the required level of student skill. This entails a decision not only regarding how well an individual learner will be expected to perform, but also a determination of what proportion of a group of learners is expected to achieve that level of proficiency. Indeed, for most applications of instructional objectives the educator will sooner or later have to say just what level of student competence will be considered acceptable.

Now the response to this requirement has too frequently been an arbitrary designation of a respectable sounding level of learner prowess such as "90 per cent of the students will display at least 80 per cent proficiency on Task X." The era of arbitrariness in establishing such proficiency levels must be brought to a squealing halt, for in some instances, e.g., teacher evaluation, the stakes are too high to condone capriciousness in setting standards. But to do so, curriculum designers must devise procedures, preferably alternative procedures, for getting a better fix on how to determine appropriate proficiency standards.

Although his problem is complicated enough to warrant a separate treatise[6], a few guidelines may be of some value. First, it must be recognized that the determination of desired proficiency standards is highly dependent on the standard-determiner's experience regarding what students are apt to be able to do with respect to the behavior in question. Ideally, we would get a firm estimate of what the learner currently does do, both before and after instruction (of various types). This, of course, can be determined through

[6]For a preliminary consideration of some possible approaches to the proficiency-determination problem, see Popham, W.J. Problems of Defining Educational Objectives and Standards in Implementing the Stull Act, paper presented at a conference on the Stull Act, Stanford University, October 12-14, 1972.

the use of conventional assessment strategies. Next, we would like an estimate of what learners can do under optimal instructional conditions, that is, we would like to identify an upper limit of proficiency. Then, we would be in a better position to say how well the learner should do. The messy problem, of course, is the can do question, for it is most perplexing to try to establish upper limits of performance, particularly in some settings where we are not confident that optimal instruction has been operative in the past. But we have to make our best guess regarding the can do question on the basis of the does do data. At the very least we could posit incremental improvement capabilities of learners, such as, "The maximum level of proficiency should be at least 3-5 per cent superior to that which is currently the case." By striving for modest improvements we may witness the emergence of a proficiency curve that, over an extended period of time, gradually improves toward an asympotote, at which point we may conclude that we've pushed as high as we can reasonably go.

But a great deal of technically sophisticated attention needs to be given to this important problem. In the end, the determination of desired proficiency levels will unquestionably be a judgment call, but we have to set up formal mechanisms to make those judgments as data-based and astute as we can possibly make them. We have barely begun to address this problem arena seriously, much less undertaken solution efforts.

Preoccupation with Prespecification

Too many recent converts to measurable objectives behave with the unthinking fervor of a just-baptized religious zealot, that is, they pay unthinking and often excessive allegiance to the focus of

their faith. There are two resulting dangers which must be carefully attended to by those who have been smitten by behavioral objectives.

First, while there are clear merits associated with prespecifying one's instructional intentions, it is possible in certain situations that there will be general goals so intrinsically worth pursuing that, even if we do not currently possess the assessment sophistication to measure their attainment, they should still be sought. This is particularly true with respect to some of the more elusive but important goals in the affective domain. This should not suggest that most important educational goals are not amenable to being operationalized by an acceptable measurable objective. Given the proper array of ingenious and well-trained people, we can usually figure out a way to get at measurable indicators of most educational goals. But it is unrealistic to expect a classroom teacher, typically harassed beyond belief by routine demands, to devise exotic assessment ploys. Yet some behavioral objectives enthusiasts would castigate a teacher who directed any proportion of instructional energy toward the attainiment of nonbehavioral goals. Such excessive zeal represents one variant of the preoccupation with prespecification syndrome.

A second form of the malady manifests itself in the activities of those evaluators who, once having written a measurable objective (apparently on a stone tablet) cannot countenance attending to any effects of instruction other than these represented by the prespecified objective. Scriven[7] has recently reminded us that when

[7] Scriven, Michael "Prose and Cons About Goal-Free Evaluation," Evaluation Comment, Vol. 3, No. 4, December, 1972, pages 1-4.

an evaluator becomes conversant with a curriculum designer's instructional intentions there is great danger that the evaluator will attend only to the anticipated effects rather than the total array of results which the instruction may produce.

This is even more true for the instructional designers themselves who, having struggled so diligently to produce intended effects, tunnel their vision to look for only those effects. We face the serious problem of getting people in education who are attempting to organize their instruction around precise statements of objectives to be additionally attentive to the entire range of results produced by an instructional sequence. As Scriven has pointed out, we must appraise the quality of the results produced by an instructional sequence, not the rhetoric of the instructional designer.

Objectives as Fear-Inducers

On the face of it, an effort to specify intended learning outcomes more precisely should probably not induce much concern from anyone. After all, the notion of pre-charting one's course is a time-honored mode of intelligent operation. Nevertheless, there are a number of anxiety problems which arise in connection with the use of measurable instructional objectives. Two of these will be briefly considered.

Some educators, particularly because they associate the use of measurable objectives with current thrust toward educational accountability, are frankly fearful that if rigorous methods are employed for evaluating instructional efficacy, then they will be found wanting. As long as the game is a loose one, where criteria are emphemeral and precise measures nonexistent, then the mediocre

educator stands an infinitely better chance for survival. But as the criteria for appraisal become more explicit, then the individual least able to stand scrutiny becomes the most terrified.

Although it will surely benefit education to exclude the incompetent from our enterprise, there are humane considerations which militate against the preparation of widespread severence notices. To the extent that we are going to impose a new set of more stringent standards on educational practitioners, we must supply corollary assistance for those individuals so that they have at least an even chance to survive under the new evaluative structure. The problem we face, simply, is that we need to give educators a reasonable chance to demonstrate their proficiency before prematurely using a newly devised evaluative system to excise them from the profession.

We must recognize, however, that there are certain instructional interventions which simply do not yield the desired results for learners. Perhaps it is because they were contrived by inadequate practitioners. If this is the case, then our responsibility is to the learners, not the ineffectual designers. We can and must use the results of an educational enterprise to help us judge whether an instructor's efforts were worthy of repetition in the future. The ineffectual can be ferreted out, at least in part, through the use of highly explicit instructional objectives. Our only regret should be that this technique will probably not permit us to isolate all of our weaker colleagues, for the harm they will visit on their students is irreparable.

The second problem that we must face deals with the fear which many educators have that if prespecified objectives are employed we will witness not only a stullification of teacher creativity but a

reduction of our instructional endeavors to a mechanistic, industrial conception of training, not education. These reservations are often voiced by the highly skilled educator, although one suspects that certain of the incompetents referred to above employ such reasons as a smoke screen to hide their questionable prowess.

Yet, no enlightened advocate of prespecified instructional objectives would argue that those objectives, once specified, must remain forever in their current form. Objectives can be modified during an instructional sequence. They can be augmented, altered, or deleted. Clearly, there are instructional opportunities which arise during an educational endeavor, opportunities which have not been anticipated, but opportunities which warrant a modification of the teacher's instructional objectives. Such modifications, without question, should be undertaken. The use of prespecified objectives as focusing devices for the instructor tends to reduce the likelihood of the teacher's whimsically following up on convenient tangents without attempting to justify those excursions in terms of their effects on learners. Nevertheless, the prespecifications of instructional objectives need not induce rigidity into the imaginative teacher's instructional world. Plans, like blueprints, can be changed.

Anticipating the Affective

Although for some years now educators have been cognizant that there has been a disproprotionate concern about cognitive rather than affective education, until recently this concern has generated more apologies than positive action plans. One of the reasons for this absence of progress has been our tendency to conceive of affec-

tive instructional objectives in the same way we conceptualize cognitive or even psychomotor objectives, namely, in terms of an individual learner's attainments. This is incorrect.

Perhaps we think of cognitive objectives as reflecting the desired status of an individual pupil because of our traditional grade-dispensing rites where a child earned an A or C in relationship to the child's demonstrated intellectual achievements. But would we ever want to grade a child because of the child's value patterns? Would we assign Mary an F if she wasn't sufficiently interested in Math, even though she could multiply like a magician? Would Harry be assigned an A because he displayed a marvelous self concept? No, our affective objectives are more clearly reflective of the tendencies of a group of learners and, as such, are better suited for use in evaluating an instructional program, not individual learners.

Now the distinction can dramatically liberate the designer of affective instructional objectives, for no longer do affective measurement strategies have to be foolproof for each learner. As long as the assessment scheme yields a valid indication of the way a group of learners is progressing, even assuming that for a few individual learners the data may be misleading, then the objective may be quite serviceable. For example, anonymous self-report inventories may be employed to provide a rough index of affective progress for a group of learners. If we awaited measuring devices that possessed the precision needed to satisfy a clinical psychologist working with individuals, we might never gather even approximations of such affective dimensions.

The specific problem we face at this time, however, is that few competent measurement designers have addressed themselves to the question of codifying assessment dimensions for instructional objectives in the affective domain. While we are beginning to get a trickle of objectives and related measures[8] in this arena, more of our measurement talent should be directed to providing educators with an arsenal of first rate affective objectives and related assessment devices. Concern with this critical problem, at a level more practical than rhetorical, is long overdue.

Summary

Within time constraints, an examination has been undertaken of the problems facing those who would specify intended learning outcomes. Among the problems considered were (1) How to encourage educators to become more sophisticated regarding the strengths and limitations of measurable objectives; (2) How to decide on appropriate levels of specificity; (3) How to identify the most appropriate objective for operationalizing a general goal; (4) How to avoid the aversive task of generating measurable objectives by expending more talent and energy in creating pools of objectives and measures; (5) How to decide upon desired levels of proficiency; (6) How to reduce excessive preoccupation with prespecified objectives; (7) How to allay educator's unwarranted anxieties stemming from the use of measurable objectives; and (8) How to stimulate the development of more objectives and measures in the affective domain.

As indicated at the outset of these remarks, we know considerably more today about the problems we face than was the case a decade

[8]For example, the Instructional Objectives Exchange distributes collections of objectives and measures dealing with children's attitudes toward school, self concept, attitudes toward drug use, tolerence, etc.

or so ago, and that is encouraging. Our knowledge base regarding this important arena is growing, albeit incrementally.

In considering the problems described here, one is struck with the fact that they represent exciting intellectual and practical challenges. They are intellectually challenging because of the difficulties associated both with isolating the critical dimension of the problems, as well as with devising alternative solution strategies. They are practically exciting because of the potential for educational harm or good associated with each problem and its solution. Perhaps this is why the whole topic of instructional objectives has proved fascinating to many of our colleagues during recent years. For with respect to instruction, or existence in general, what good is a life without some excitement?